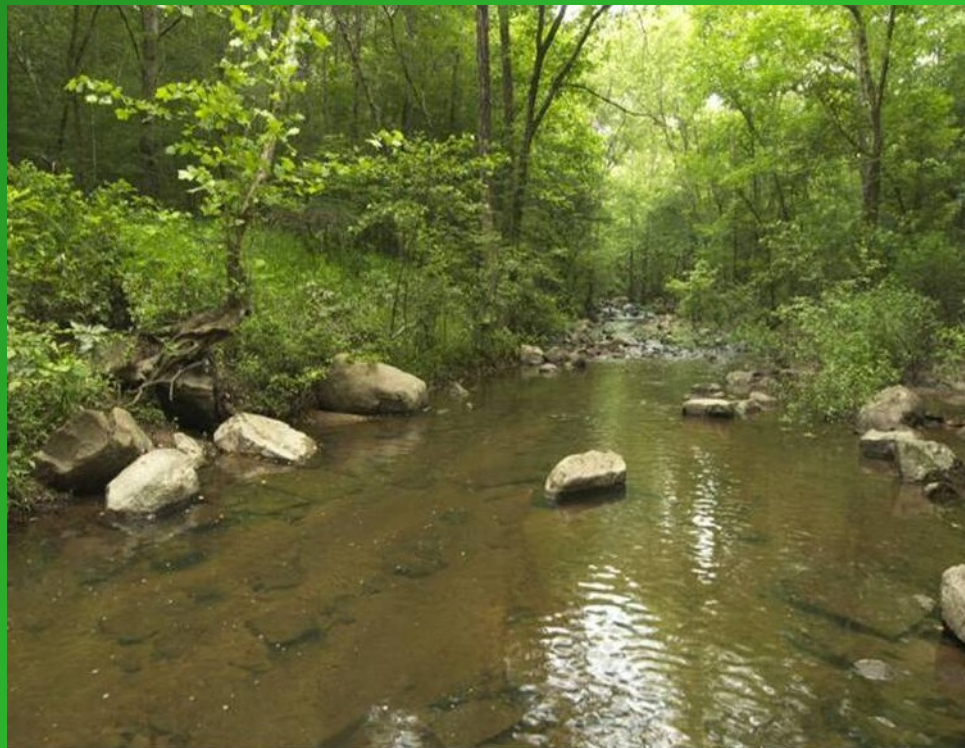




MDC Resource Science

Reforestation Riparian Corridors in the Ozarks: Natural Regeneration

Science Notes



Reforesting Riparian Corridors in the Ozarks: Natural Regeneration



By Kyle Steele, Randy Jensen, and John Kabrick

Goal: Determine the effect of five vegetation treatments on natural tree regeneration in tree plantings along Ozark old-field riparian corridors.

Summary

Many land managers are attempting to reforest riparian corridors in the Missouri Ozarks. The most common restoration technique is planting bare-root seedlings, which has often had poor or mixed success. Some have suggested that using natural regeneration in combination with vegetation management may better fit management objectives and prove more cost effective. We designed an experiment to examine natural hardwood regeneration in old-field riparian corridors of the Missouri Ozarks using five vegetation management treatments replicated at three sites. All sites were initially treated with Roundup® as a site preparation. Treatments included: 1) Roundup® site preparation only; 2) a single, first-growing season application of the grass-selective, post-emergent herbicide Poast Plus®; 3) redtop grass cover-crop; 4) white clover cover-crop; and 5) Virginia wild rye cover-crop, a native species.

Results

After two growing seasons, a total of 27 tree species were identified during the natural regeneration inventory (Table 1). Most species encountered were elms, sycamore, persimmon, and green ash, which totaled greater than 75 percent of all stems. Additional species were uncommon.

Table 1. Proportion of natural regeneration inventoried.

Group	Species	Percent
Light-seeded	Sycamore	26
	American elm	23
	Winged elm	7
	Green ash	6
	Box elder	2
	Maple	1
	White ash	<1
	Slippery elm	<1
	Silver maple	<1
	Musclewood	<1
Hardmast	Black walnut	4
	Shumard oak	4
	Shingle oak	2
	Bur oak	1
	Hickory spp.	1
	Willow oak	<1
	Bitt. hickory	<1
	Pecan	<1
	Ohio buckeye	<1
Softmast	Persimmon	14
	Honey-locust	3
	Redbud	1
	Hawthorn	1
	Black cherry	1
	Sassafras	1
	Red cedar	<1
	Red mulberry	<1

Table 2. Regeneration density by treatment and species group.

Group/ Treatment	Stems/ac
All Species	
Roundup®-only	512
Poast Plus®	725
Redtop	118
Clover	146
VA wild rye	146
Light-seeded	
Roundup®-only	473
Poast Plus®	518
Redtop	72
Clover	95
VA wild rye	87
Hardmast	
Roundup®-only	13
Poast Plus®	72
Redtop	37
Clover	38
VA wild rye	28
Softmast	
Roundup®-only	34
Poast Plus®	144
Redtop	21
Clover	27
VA wild rye	23

The herbicide-only treatments had more regeneration than in the cover-crop treatments; and were most dense in Poast Plus® treatments (Table 2). The majority of species regenerating were wind dispersed, early-successional species.

Distance to forest edge was found to be an important source of variation for all species combined, but particularly the hardmast group (Figure 1). Hardmast-producing species were uncommon and showed a significant negative relationship with increasing distance from the nearest forest edge. A similar trend occurred when all species were grouped together. In general, the strongest decreases in stem density occurred between 10 and 100 ft, after which oak species were essentially absent.

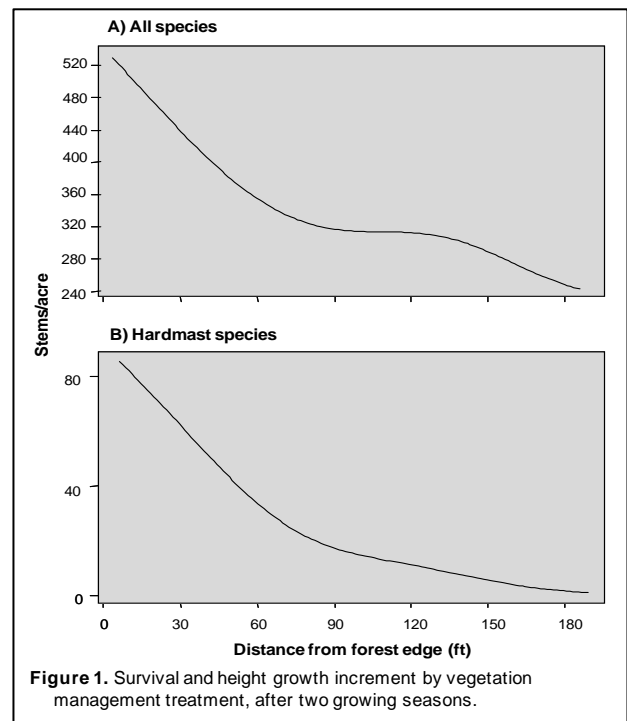


Figure 1. Survival and height growth increment by vegetation management treatment, after two growing seasons.

Management Implications

Although this study provides only two years of information following treatment establishment, these data suggest that artificial means of regeneration is necessary for most species, especially the hardmast group. Mature, light-seeded species that are adjacent to a reforestation site can provide sufficient tree regeneration in narrow riparian corridors, but this effect will decrease rapidly as distance from the forest edge increases. When reforesting wide riparian corridors, or those without existing mature trees, a manager should consider supplemental plantings of hard and soft mast-producing tree species.

For more information, contact:

Missouri Department of Conservation
Resource Science Center
1110 S. College Avenue
Columbia, MO 65201
(573)882-9909 ext. 3263
Kyle.Steele@mdc.mo.gov

Keywords: riparian reforestation, Ozark Highlands, natural regeneration, cover-crops, bottomland forest restoration

For more information on this study, please see Science Note 2009 Volume 4 NO. 22